Application No.: 10/608,300   8   Docket No.: 509982005500

REMARKS

In the Office Action mailed on October 6, 2005, the Examiner rejected claims 1-29. Claim 1 has been amended to clarify a typographical error as suggested by the Examiner. Claims 1-29 are currently under consideration. Applicants respectfully request reconsideration of the pending claims in view of the following remarks.

I.   Examiner's Objection.

The examiner has objected to claim 1 because of a typographical error. The Applicant has amended claim 1 to correct the typographical error as suggested by the Examiner.

II.   Rejection Under 35 U.S.C. 112

The Examiner has rejected claim 8 under 35 U.S.C, first paragraph, for failing to comply with the enablement requirement.

Applicants traverse the rejection of claim 8 under 35 U.S.C. 112, first paragraph. MPEP 2164.04 states:

> In order to make a rejection, the examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993) (examiner must provide a reasonable explanation as to why the scope of protection provided by a claim is not adequately enabled by the disclosure). A specification disclosure which contains a teaching of the manner and process of making and using an invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented must be taken as being in compliance with the enablement requirement of 35 U.S.C. 112, first paragraph, unless there is a reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support. Assuming that sufficient reason for such doubt exists, a rejection for failure to teach how to make and/or use will be proper on that basis. *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). As stated by the court, "it is incumbent upon the Patent Office, whenever a rejection on this basis is made, to explain *why* it doubts the truth or accuracy of any statement in a supporting disclosure and to back up assertions of its own with acceptable evidence or reasoning which is inconsistent with the contested statement. Otherwise, there would be no need for the applicant to go to the trouble and expense of supporting his presumptively accurate disclosure." 439 F.2d at 224, 169 USPQ at 370. (Emphasis added.)

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In the present case, the subject matter being sought in claim 8 corresponds in scope to what is disclosed in paragraph [0044] and [0045] of the present specification. In particular, claim 7 from which claim 8 depends recites that the training output data is transformed using principal component analysis. Claim 8 recites that the training output data is divided into a first portion and at least a second portion, a first machine learning system is configured to be trained for the first portion, and a second machine learning system is configured to be trained for the second portion. Paragraph [0044] discloses that the set of diffraction signals used to train a machine learning system is transformed using principal component analysis. Paragraph [0045] discloses that the dimensions of the diffraction signals can be divided into at least two partitions, and that a machine learning system can be trained for each partition. Thus, in order for the present rejection to be maintained, the Examiner must explain why the Examiner doubts the truth or accuracy of the statements being made in paragraphs [0044] and [0045].

Additionally, the Examiner appears to be asserting that claim 8 is not enabled because there are many ways of doing the partitioning. First, Applicants note that the subject matter being sought in claim 8 is the act of dividing/partitioning and not a particular way of partitioning. (The adequacy of the disclosure must be evaluated in view of the subject matter being claimed. (See, MPEP 2164.08.)) Second, Applicants assert that the Examiner's very assertion that there are many ways of doing the partitioning suggests that the act of dividing/partitioning is something that can be done. Indeed, Applicants asserts that the act of dividing/partitioning data, even data that has been transformed using PCA, is one that is well known by one skilled in the art and that the specifics can be omitted. (See, MPEP 2164.08, citing *In re Buchner*, 929 F.2d 660, 661 (Fed. Cir. 1991).)

Thus, Applicants request that the Examiner withdraw the rejection of claim 8 under 35 U.S.C. 112, first paragraph.

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III.   Rejection under 35 U.S.C. 103(a)

A.   Claims 1-6, 9-15, and 16-29

The Examiner rejected Claims 1-6, 9-15, and 16-29 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,650,422 (the Singh reference) in view of U.S. Patent No. 6,192,103 (the Wormington reference).

With respect to independent claims 1, 16 and 22, the Applicants assert that neither the Singh nor the Wormington reference, individually or in combination, teach or suggest obtaining a second diffraction signal using a machine learning system, wherein the machine learning system receives as an input one or more parameters that characterize a profile of the structure to generate the second diffraction signal.

With respect to the Singh reference, the Examiner states that the Singh reference fails to disclose obtaining a second diffraction signal using a machine learning system, wherein the machine learning system receives as an input one or more parameters that characterize a profile of the structure to generate the second diffraction signal, recited in independent claims 1, 16 and 22. The Examiner cites the Wormington reference as disclosing, obtaining a second diffraction signal generated using a machine learning system and combines it with the Singh reference to render claims 1, 16 and 22 obvious under 35 U.S.C 103(a).

In rejecting claims 1, 16 and 22, the Examiner asserts that the genetic and evolutionary algorithms disclosed in the Wormington reference are machine learning algorithms. While Applicants concur that genetic and evolutionary algorithms are machine learning algorithms, Applicants assert that the Wormington reference discloses using a genetic algorithm, particularly an evolutionary algorithm, to form a new parameter vector from two parameter vectors rather than to generate a second diffraction signal as recited in independent claims 1, 16 and 22.

In particular, the Wormington reference discloses using, "a particular evolutionary algorithm known as Differential Evolution to combine two parameter vectors from one generation of vectors

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<u>to form a new parameter vector</u> for the next generation." (Emphasis added; col. 3, lines 48-52.) Additionally, with reference to Figure 6, the Wormington reference discloses, "After the initial population vector is analyzed, the random recombination and mutation of members of the first population is used to create an offspring population at step 70. The X-ray scattering data for each member of the offspring population is simulated at step 72, and the fitness of the simulated data is evaluated at step 74, using the error function." (Col. 9, lines 45-55.) In addition, col. 10, line 26-50, of the Wormington reference, discloses that "the differential evolutionary algorithm employs a relatively simple approach to <u>create new population members</u>", which are used as inputs to calculate the X-ray scattering data. (Emphasis added.)

Thus, the evolutionary algorithm, as disclosed by the Wormington reference, is used to generate a new parameter vector and create new population members. The evolutionary algorithm does not generate the X-ray scattering data. Instead, the new parameter vector and the new population members, which are generated by the evolutionary algorithm, are used as inputs to simulate the X-ray scattering data. Thus, the Wormington reference does not disclose using a machine learning system to generate the second diffraction signal, as recited in independent claims 1, 16, and 22.

In light of the above arguments, Applicants assert that the combination of the Singh and the Wormington reference fails to teach or suggest each and every claimed element, and thus the rejection of independent claims 1, 16, and 22 should be withdrawn.

The rejection of claims 5-6, 9-21, and 23-29 should be withdrawn for at least the reason that they depend from an allowable base claim.

B.   Claim 7

The Examiner has rejected claim 7 under 35 U.S.C. 103(a) over the Singh reference in view of the Wormington reference and further in view of EPN 0448890 (the Sirat reference). Applicants assert that claim 7 is allowable for at least the reason that it depends from an allowable independent claim.

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IV.   Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, Applicants petition for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 509982005500. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: January 6, 2006   Respectfully submitted,

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